Center Innovation Fund: ARC CIF

Preliminary Calibration of PARC Hyperspectral Imager for NASA Planetary Lander Missions

Completed Technology Project (2017 - 2018)

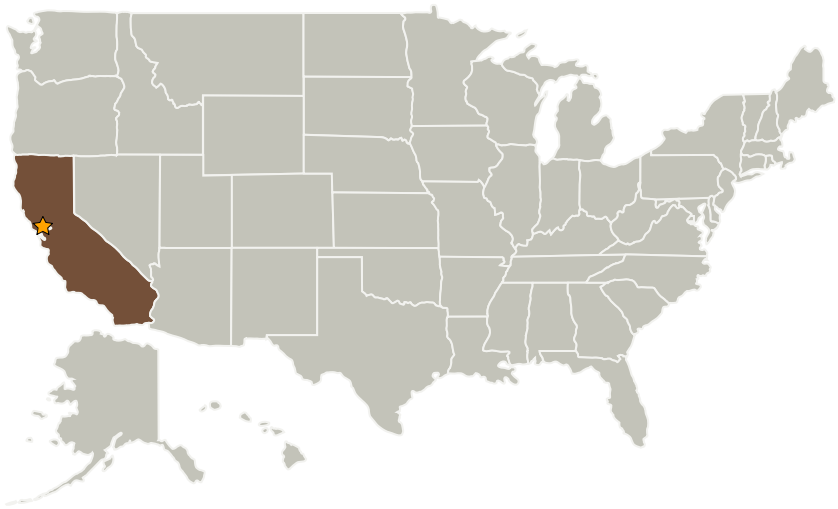
Project Introduction

Wavelength offset and instrument spectral response will be calibrated using helium spectral calibration lamp and a calibrated halogen lamp coupled to a monochromator, respectively. We will develop a signal processing pipeline to remedy spectral artifacts and increase out-of-band rejection by attempting to correct for phase errors in the measured interferogram, and by properly applying apodization prior to Fourier transformation. We will extract spectra from ALCHERA images of mineralogical samples and compare against laboratory spectra of the same samples.

Anticipated Benefits

Instrument response, stability, and spectral performance of the Palo Alto Research Center's (PARC) Actuation of Liquid Crystal for Hyperspectral Remote Analysis (ALCHERA) hyperspectral imager are not well characterized. Conventional multispectral imagers have significant limitations in optical throughput (~1 % – 3 %), optical bandwidth, minimum size, and dynamic configurability. We will perform an instrument response calibration of the ALCHERA to characterize its spectral performance and to eliminate instrument-related artifacts.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Palo Alto Research Center(PARC)	Supporting Organization	Industry	Palo Alto, New Mexico

Primary U.S. Work Locations
California

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

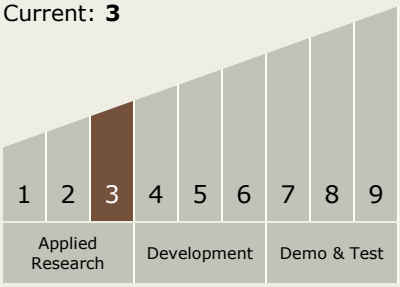
Harry Partridge

Principal Investigator:

Anthony Colaprete

Technology Maturity (TRL)

Start: **3**
Current: **3**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

Mars, Others Inside the Solar System